VEGETABLE CROPS

CORNELL COOPERATIVE EXTENSION

Scab of Cucurbits

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Although scab of slicing and pickling cucumbers is rare because of the availability of many resistant varieties, this disease can still be of significance for other cucurbits including summer and winter squash, true and other pumpkin types, muskmelon and cantaloupe, and gourds. This fungal disease can attack all parts of the plant, but is most damaging because of the unsightly scab lesions that develop on fruit, usually making them unmarketable.

Cause

Scab is caused by the fungus *Cladosporium cucumerinum.* The disease is widespread in North America and Europe and can occur every year if moisture or rainfall is plentiful and if temperatures are below normal. The spores, or conidia, of the fungus are formed in long, branched chains and are borne on fairly long conidiophores, thus enabling spores to be dislodged easily. Spores can be blown long distances even in moist air.

Symptoms

The scab fungus can attack any aboveground portion of the plant including leaves and petioles (fig. 1, butternut squash), stems and fruit (fig. 2, acorn squash). On *leaves* and *runners,* pale-green water-soaked areas are the first sign of the disease. These spots gradually turn gray to white and become angular shaped. A chlorotic halo may appear around the lesion (fig. 1). If weather conditions are favorable, scab can deform young leaves (fig. 3, summer squash), and the apical runners of young plants like melons can be killed. Sporulation on leaves tends to be sparse. On *fruit,* scab can produce the greatest damage, especially if they are infected when young. Spots first appear as small sunken areas similar to insect stings, about 1/8 inch in diameter (fig. 3). A sticky substance may ooze from the infected area. The spots become darker with age and may create a cavity in summer squash fruit, which are very susceptible. The cavities may be lined with a dark olive green, velvety layer of spores. Secondary soft rotting bacteria may also invade the cavities and lead to foul-smelling decay. On highly resistant cucurbit fruits, spores are more difficult to detect, and lesions may remain quite superficial (fig. 4, butternut squash). The time when fruits are infected may determine the relative severity of symptoms as illustrated on true pumpkin variety Howden (fig. 5). The susceptible cheese pumpkin can show numerous sites of fungal infection on both immature and mature fruit (figs. 6, 7). Watermelon is considered to be highly resistant as shown in the superficial infection of fruit under severe disease pressure (fig. 8).

The only disease that scab is likely to be confused with is angular leaf spot, caused by the bacterium *Pseudomonas lachrymans.* Many of the symptoms described are nominally similar for leaf spot, including angular-shaped leaf lesions, which become ragged holes with time, and small circular fruit lesions, which, as the tissue dies, become white and crack open, allowing oozing to occur. Angular leaf spot can infect cucumber, squash, and pumpkins, whereas scab is now rare on cucumber. Lack of the olive green sporulation of scab serves to distinguish between angular leaf spot and scab. Angular leaf spot is also more likely to infect the foliage, whereas the scab infection occurs on both the foliage and the fruit.

Epidemiology and Host Range

The fungus causing scab overwinters mainly in squash and pumpkin vines, but may also be seedborne. Spores are produced in the spring and are readily spread. They germinate and enter susceptible tissue within 9 hours. A spot may appear on leaves within 3 days, and a new crop of spores is present by the 4th day. The most favorable weather conditions for disease development are wet weather (valley fogs, heavy dews, and light rains) and temperatures near or below 70° F (21° C). At 63° F (17° C) growing tips of young plants are killed. The relative susceptibility to scab of various culinary types of cucurbits is given in the table.


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The photographic work of Kent Loeffler is gratefully acknowledged.

Relative Susceptibility of Cucurbits to Scab

Culinary type	*Species*	*Resistance/susceptibility**
Slicing and pickling cucumbers	*Cucumis sativus*	Excellent resistant varieties controlled by a single dominant gene occur in both types.
Summer squash	*Cucurbita pepo*	Medium and dark green and yellow types are all susceptible.
Pumpkin	*Cucurbita pepo*	Examples such as Howden, Small Sugar, and Connecticut Field are all susceptible.
	Cucurbita moschata	Examples such as Cheese, Kentucky Field, Golden Cushaw are probably all rated as susceptible.
	Cucurbita maxima	Examples such as Mammoth are susceptible.
Winter squash	*Cucurbita pepo*	Examples such as acorn types are moderately resistant.
	Cucurbita moschata	Examples such as the butternut types are moderately resistant.
	Cucurbita maxima	Examples such as Blue Hubbard, Boston Marrow, Buttercup, Delicious, French Turban, and Golden Delicious types are probably all moderately susceptible.
Gourd	*Cucurbita pepo*	Moderately susceptible.
Watermelon	*Citrullus lanatus*	Highly resistant.

**Susceptible* = foliar symptoms and deep penetration of fruit; *moderately susceptible* = some foliar symptoms and moderate penetration of fruit; *moderately or highly resistant* = few foliar symptoms and restricted lesion development on fruit; *resistant* = genetically conferred resistance without symptom development.

Control

1. Use only disease-free seed and treat with a seed fungicide to additionally control seed decay and damping-off. Do not save your own seed if disease is present.

2. Grow scab-resistant cucumber varieties so that scab fungicide sprays can be omitted.

3. Select sites that have well-drained soils and are conducive to good air drainage to allow for rapid drying of foliage.

4. Follow crop rotations of 2 or more years between cucurbit crops and nonhost crops.

5. Use fungicides to control scab, but specific points need to be made to increase their effective use. During cool, wet weather, fungicide sprays are not totally effective because of the short disease cycle. During these periods, sprays should be applied every 5 days rather than weekly. *Early applications before fruit formation are important.* For squash, apply when plants begin to bloom or, if conditions warrant, when first true leaves appear. For melons and pumpkins, apply when vines begin to run or earlier if conditions warrant. The following fungicides are presently registered for use, but consult the most recent Vegetable Recommends or the label for specific rates. Dithiocarbamates include maneb (flowable and WP) for melons (muskmelon and watermelon), pumpkin, and squash (summer and winter); mancozeb (WP) for use on melons and summer squash only; metiram (Polyram) for muskmelons; captafol (Difolatan) for melons; chlorothalonil (Bravo) for melons, squash, and pumpkin; and anilazine (Dyrene) for melons, squash, and pumpkin.

Brand names and varieties are mentioned for clarity. No endorsement or discrimination is intended.

Quantity discount available.

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